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The Trade Review.

A JOURNAL OF MANUFACTURES, COMMERCE, INDUSTRY, SCIENCE, ART AND INVENTION.

Vol. XIV.—No 18. CLEVELAND, APRIL 30, 1881. No. 691

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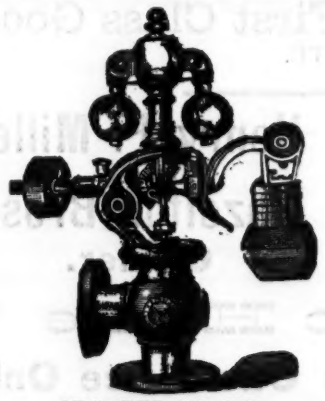

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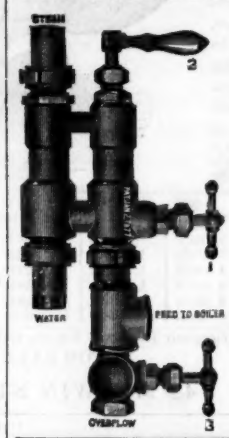

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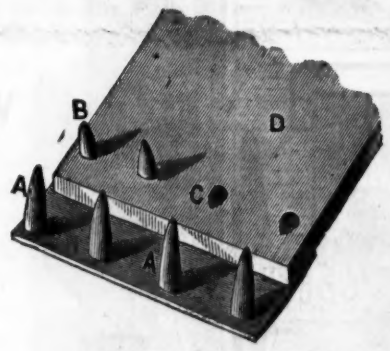

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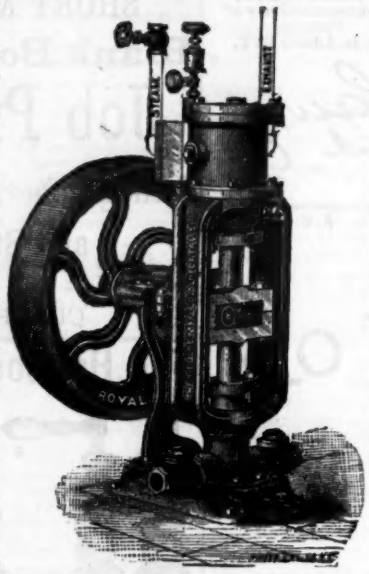

The "Royal" is a new and improved independent boiler feeder, designed by our mechanical engineer, after a critical examination of all other feeders, and therefore has many points of merit in its arrangement, construction and proportions not found in any of the numerous ones now offered in the market. It is very simple and substantial, composed of few parts, and all parts so made that duplicates can be supplied for repairs with absolute certainty of interchanging. The main or frame casting, with supporting arm, is all in one piece, so that the shaft revolves in perfectly rigid bearings, while the eccentric connection works in a vertical line, without any lateral pressure on the valve rod to heave and pull the steam chest, cramp the rod and create friction. The cylinder heads have ground surfaces; the space between cylinder and chest is tapped on either side for the exhaust steam pipe and the glass globe check valves are each designated "suction" or "discharge," for convenience, and can be connected on either side of pump if necessary. We have no references to offer our friends concerning this feeder, as it has never been introduced, but we hope our assurances concerning it, in connection with our reputation as manufacturers of only first-class goods, will be sufficient to induce the trade to give it a trial. Every pump is fully guaranteed.

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No. 1	3 inch	1¾ inch	3 inch	¾ inch	¾ inch	1 inch	100	1.93	15 HP	$ 44 00
No. 2	3½ inch	1¾ inch	3 inch	¾ inch	¾ inch	1 inch	100	3.12	27 HP	55 00
No. 3	4 inch	2¼ inch	4 inch	¾ inch	1 inch	1¼ inch	90	6.20	46 HP	66 00
No. 4	4½ inch	2¾ inch	4 inch	¾ inch	1 inch	1½ inch	85	8.75	62 HP	82 50
No. 5	5 inch	3½ inch	4 inch	¾ inch	1¼ inch	1½ inch	80	13.33	106 HP	110 00
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FOURTEENTH YEAR.

The only strictly Manufacturing, Industrial and Scientific Paper published in Ohio.

THIS JOURNAL IS APPOINTED THE OFFICIAL ORGAN OF THE OHIO INSTITUTE OF MINING ENGINEERS.

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CLEVELAND'S MANUFACTURES, TRADE AND COMMERCE,

Cleveland needs a statistical "showing up." The country should know what are her manufactures, what the number of her industrial establishments and mechanics, the value of the products annually turned out in each class of manufacture, and the nature and extent of her trade and commerce. Each year that the compilation of these statistics is delayed we are placed at a greater disadvantage. It is a great point in all such statistics to show the rate of progressive increase. In the files of the TRADE REVIEW the greater part of the required information as to trade and commerce may be found, and there are few if any manufactories of any note respecting which full details have not appeared in our columns. All Custom House statistics have also been published, with estimates obtained from the best authorities as to deliveries and shipments by rail and water. But what is wanted is an authoritative presentation of all facts bearing on our industry and trade in the annually published volume of the Ohio Statistics, in which Cleveland yearly makes so miserable a show, whilst Cincinnati and Toledo are set off to advantage in pages bristling with figures and replete with facts. Last year's Ohio Statistics simply gave a list of Cleveland industries, reminding one of an auctioneer's catalogue. We long ago urged the Board of Trade to exercise its proper functions in the compilation of the returns required, and so win a reputation it has never yet acquired. It has just now one thousand dollars in its treasury, and if it will only show proper spirit in this matter further funds will not be wanting. The absence of any "show" worthy the name in Ohio Statistics is simply disgraceful to Cleveland, and robs it of much of that renown it deserves. We tell through this government work to the world that we are without that healthful spirit known as public enterprise. Auditor Bauder is about calling on the Board of Trade to undertake the work.

A "LOW TEMPERATURE MOTOR."

We confess we have no confidence in the extraordinary claims set forth for the low temperature motor, with which, in its incomplete state, set up at the Navy Yard, Washington, Professor Gamgee has beguiled Chief Engineer Isherwood, securing his enthusiastic endorsement of the theory and system. Much the same thing was years since brought over by the French inventor Du Trembly, sulphuric ether being used instead of ammonia, and tried in our presence. The engine proved valueless for any practical purpose; the force with which it worked could not be regulated. Gamgee's idea is built on the fact of the low temperature at which ammonia is capable of being volatized, and the readiness with which it can be condensed, and playing of the difference of temperature in one boiler (for he has two boilers) against that in the other, "the difference creating a self-sustaining motor power." Everybody knows that heat and cold are antagonistic, but this setting of a low pressure boiler against a high pressure boiler is absurd, talk as Gamgee and Isherwood may about the agreement of the method with thermo-dynamical principles.

ECONOMY IN THE USE OF STEAM.

Whatever contributes to lessen outlay in manufacturing operations merits notice in our columns. Competition in production has become so close that the highest economy is now an absolute necessity. One direction in which this is confessedly attainable is in putting to fullest account the heat generated by the furnace. To this end furnaces have been improved on so as to minimise the amount of fuel burnt, and various systems have been introduced to secure by induction a portion of the heat of exhaust steam. So far as the utilization of exhaust steam is concerned, we find no method so efficacious or economical as that which has been invented by Mr. J. E. Myrick, the eminent engineer, a description of which is furnished in another column. Whether in this city or elsewhere, wherever manufacturing operations are carried on, we find exhaust steam escaping in volumes, representing an extravagant waste of heating power. The inventive genius of J. E. Myrick has at last come to the aid of manufacturers, and startling as the statement may strike some of our readers, it is nevertheless true that he has provided the means for reducing the outlay of fuel for boilers by over one third. This is effected by a most ingenious but simple contrivance. By this invention the water previously to its entering the boiler is made to take the form of spray, with which the exhaust steam is brought in contact, then passing by a forcing process in condensed form into the boiler. The action is almost momentary, and that the greater portion of the heat of the exhaust steam is absorbed is evident from the fact that the temperature of the water on entering the boiler is 212 degrees. In addition to this, as the exhaust steam is used over and over again, only one-third of the water usually required to be heated has to be dealt with, and this under the favorable condition of the high temperature we have named. Thus the consumption of coal is materially curtailed. What is of prime importance, the Buckeye Feed-Water, Heater and Myrick Pump, which is the name of the invention, can be applied to any description of engine. The structure of the engine will, as a matter of course, somewhat vary the results, the best showing being with low pressure engines; but with all an important saving in coal is effected. As showing what can be accomplished, we may state that an engine at Detroit furnished with one of Myrick's Feed-Waters, and which was set in the open air throughout the most rigorous portions of the past winter, was kept in full action at far less expenditure of fuel than would have been necessary had it been housed and unsupplied with this invention. We confidently believe that this admirable system, which appears to solve an evident difficulty with which engineers have labored, represents the true method of dealing with exhaust steam and is destined to general adoption.

CLEVELAND MACHINE MOULDERS.

The striking machine moulders in this city maintain firmly their position, refusing to go in for anything less than an advance of 15 per cent. The prices of the shops show a wide range of from $1.75 to $4 per day; the prevailing prices, however, for nine hours' work is from $1.75 to $2.50. One of the committee has stated that the men receiving $4 are mostly satisfied with the price. At a meeting held on the 26th inst., a committee of one from each shop was appointed to prepare and publish the scale of prices which the strikers wish to have raised. The men set forth that occasions occur when they have to work from one and a half to two hours overtime with no extra pay. The founders appear disposed to give the wheelwright moulders the full advance asked, but to accede no more than 10 or at most 12½ per cent to the men. Should the strikers persist, efforts will probably be made by employers to obtain moulders from other quarters.

For the Trade Review.

COAL CUTTING MACHINERY.

BY ANDREW ROY, OHIO STATE INSPECTOR OF MINES.

For upwards of a hundred years experiments have been going on with coal cutting machinery to do the laborious work of the coal miner, and in England more than one hundred of these machines have been patented from first to last. Nearly every one has proved in practice a financial failure—doing the work designed but failing to reduce the cost of getting the coal. Some of the coal cutters are still in use in long wall mining and are successfully holding their own, and it is simply a question of time when machinery shall become of general application in coal getting everywhere.

In Ohio, labor-saving machinery has been used successfully for four years in the mines of the Hocking Valley, and mining machinery is slowly but gradually supplanting the pick in several districts of the State. In Brooks mines, and in Longstreth's mines, in the Hocking valley, the coal cutting machines are run daily; at Shawnee they are about to be applied, and they have been introduced for some months at the new mining district of Corning in the Sunday Creek valley. In the new coal field opened in Wheeling Creek, in Belmont county, also mining machinery has been erected, and the "Iron Miner" has also found his way in the mines of the Mahoning valley.

Beyond Ohio, in the block coal region of Brazil, Indiana, mining machinery has been successfully applied for several years. In Illinois the coal cutters are invading the domain of the collier in the Braidwood region. And in the far west in the new coal districts of Colorado mining machinery has already got a firm and permanent foothold. Mining machinery may not be welcomed by, but will come as the best friend of the miner. The black-faced delvers of our mineral fuel may rebel at its introduction but before five years roll round they will bless its invention and application to coal mining. It will not reduce wages but will increase them rather, since the tendency of all labor-saving machinery is to increase wages by lessening the cost of production.

PROPOSED DIVERSION OF ROUTE FOR WESTERN GRAIN.

There are men whose special qualification it is to take advantage of existing organizations and mould them to their purpose; who taking up the threads, as it were, of separate enterprises secure for a specific purpose the union of these, thus assuring a development of power unattainable among divided interests. Of such men is Jay Gould, for whom no scheme bearing on transportation is too vast provided it can be compassed by existing lines and such as are in process of formation or can be constructed in a reasonable period. This railway magnate who has been vaguely reported to have been "preparing to drop latitudinal roads for longitudinal lines" is now credited with having

entered on negotiations for the purchase of the railway route from Chicago to New Orleans, to be supplemented by the control of the river systems leading from Chicago and St. Louis to that port, the scheme contemplating the command of the gateway of Mexico, as well as the building up of New Orleans at the expense of New York as an outlet of the grain trade of the West and Northwest. Already Gould's line of laden barges float down the Mississippi. St. Louis, were the scheme fully realized, would hold the same relation to New Orleans as the purveyor of commerce in cereals that Chicago now holds to New York; a countervailing influence would be exerted to weaken the hold which New York by a vast expenditure of capital has secured on the Western grain trade, as well as on the southern cotton crop, and the natural advantages of New Orleans for foreign trade, once so conspicuous, again assert themselves. Such is the project for a rivalry in this country between railways and great cities based on geographical position. With the foreign share and bondholders of the Illinois Central and the Chicago & St. Louis & New Orleans roads, both owned by one association of shareholders, and about 1,800 miles in length, Gould is now said to be negotiating. Gould's object, should he really be carrying out the scheme, is of course to get a premium on the shares and bonds of the lines brought in, with the further gains obtainable by an additional issue of fresh stock based on his rail and river systems, leaving those on whom he loads his scrip to discover for themselves whether the southern route will not be after all a secondary one; for it is a hard matter at any time to disturb in any material degree the existing course of trade. Gould lately said to some of his friends that there was material in the North and South roads, under an energetic manipulation, for a tremendous boom. There is enough in the scheme to recommend it when in working order to a host of investors, who thinking to follow the lead of successful speculators are left by these in the lurch without any sort of forewarning. We need not discuss the additional cost in ocean transport from New Orleans to Europe as compared with New York; or the effect of any real competition to reduce railway charges on eastbound freight. It is impossible, however, that New Orleans should not largely profit by the development of our foreign commerce; and it is just as certain that in the future she will grasp a very full share of it.

A MECHANIC'S INSTITUTE WANTED FOR CLEVELAND.

We cannot conceive of any institution that would prove of more general benefit to Cleveland than one that would afford the opportunity to our mechanics of attending scientific lectures given by thoroughly qualified men, of perusing home and foreign journals devoted to arts and industries, and provide for young men evening classes for technical instruction. Mechanic's Institutes of this character are no novelty in this country and are to be met with in all the industrial centres of Europe. Their influence has been powerful in the development of thoughtful intelligence and skill. It has been truly affirmed that the only method of bringing home scientific truths is by demonstration, and this would be effected by suitable lectures setting forth facts in science and mechanics; pointing out the scope for the application of principles in the arts, and illustrating principles by results—ever the readiest method of imparting knowledge. Whatever may be said of the value of technical literature, it is not congenial to the mass of our mechanics; who are besides indisposed to spend time or money in experimenting. They need to be "educated" by having their perceptive faculties appealed to by convincing or striking illustrations; and elsewhere, in countless instances, they have not been slow in bringing the knowledge acquired in the lecture room to bear on their special branches of work, and thus finding play for their suggestive faculties, have, as a result, sought to improve on methods and processes. The lectures given in the Mechanics' Institutes in this and other countries, are resorted to by large numbers of persons other than mechanics, but with these their sterling utility is manifested in countless ways. The evening classes would aid in training youths for the workshop; whilst the resort to the industrial journals would feed awakened inquiry as to the progress of invention, and generally as to technical industries. In this great manufacturing city such an Institute would doubtless flourish. In cities that cannot cope with our own in the scale and variety of industries, they have proved self-sustaining. The advantages that would arise from a Mechanic's Institute in Cleveland should prompt an effort towards its realization on the part of our city manufacturers.

THE CLEVELAND BUILDERS' EXCHANGE.

That the Cleveland Builders should just now have established an Exchange which shall afford a center of union, enabling them to exchange views and confer on all topics of common concern, excites no surprise, the wonder being that this Exchange was not established before. Our builders constitute a most important body; their yearly operations in the purchase of materials and payment for construction is to be counted by millions of dollars; a large number of manufacturing industries are tributary to their wants, and thousands of men are directly employed by them. Building in this city has received an important impulse from the prosperity attending its growing industries. Manufactories need to be enlarged; for tenements large and small there is a demand which as yet cannot be met, and for years to come the activity in building is likely to be maintained. Fields and gardens and plantations are yielding weekly, on the outskirts of the built-up portions of the city, to the inexorable demand for more building lots. The members of the Exchange are desirous of removing the impression that their movement is in any way hostile to the interests of labor, desiring, as they do, to maintain cordial relations with their men, and believing that their conferences will have the result of imparting to their business greater stability by rendering outlay for material more calculable, and eliminating much of the speculative element which has interfered with operations.

A commercial contemporary sees the advantage of the maintenance of a "corner" on hog products, urging that if prices of American bacon and ham were reduced in the English market, the public there would regard the decline as confirming the false statements circulated as to the prevalence of trichynosis in American pork and bacon. This is a far-fetched and unsound argument for the maintenance of artificial prices on behoof of a few wealthy speculators.

The ice of Lake Erie is gradually yielding to sunny weather and warm showers. Life and animation is returning to our wharves. All concerned in lake shipping here are on the lookout for increased business. We shall certainly ship more coal and import more iron and lumber than at any previous period. The reduction of railway freight charges is of course one of the good things coming. At Buffalo it is calculated that the opening of navigation for that port will not take place before the 15th inst.

The furnaces of the Cleveland Rolling Mill Company are shut down in consequence of a strike of a number of blast foundry men who demand $1.62 to $2.10 for top fillers; $1.50 to $2 for bottom fillers; and $1.20 to $1.50 for laborers. The seventy-five men thus on strike are using their efforts to induce other furnace men to strike for a similar advance.

MANUFACTURES.

TO MACHINISTS, MANUFACTURERS AND OTHERS.

The publishers of The Trade Review solicit items of information concerning manufacturing and other establishments in any part of the country, and all such items will be promptly inserted in these columns, free of charge. Facts are the only things needed; and all communications should be accompanied with the name of the contributor—not for publication—but as a guarantee of good faith.

Manufacturers, machinist and engineers are particularly requested to communicate any matters of interest relating to their specialties. No one need be deterred from sending any interesting facts in his own language, as all such contributions will be properly revised before sendin to press.

OHIO.

The Elyria Shear Works are to be removed to Youngstown.

Benj. Harker & Sons, of the East Liverpool Wedgwood Pottery, are running three kilns.

Pennock, Bros., Minerva, are enlarging their car shops by erecting a building 60x100 feet.

At Youngstown, Homer Baldwin is putting the old Diamond Mill in shape for grinding flour.

Mr. Coates, Alliance, is very busy manufacturing hay rakes, in which he employs several hands.

The Friend & Forgey Paper Co., Franklin, are about to set up one large power fire pump, manufactured at Hamilton.

W. W. Cantine & Co., Alliance, who have been in business six months,carry one of the best stocks of hardware in that part of the State.

The Monarch & Eclipse Company has been organized at Hamilton; they have purchased the Owens and Lane Dyer Machine Works

It is said that it requires over 1,400,000 bushels of oats from which to manufacture Akron's annual out-put of 110,000 barrels of oatmeal.

The proposed glass works at Niles is rapidly assuming definite shape, $7,000 having already been subscribed and land given for building purposes.

J. H. McGowan & Co., steam pump manufacturer, Cincinnati, have just completed and moved into their new shop, which occupies about half a square.

The Buckeye Iron and Brass Works, Dayton, illustrate the activity of the times,150 hands being employed in engine building and water and steam fitting.

The Variety Iron Works Company, Cleveland, have secured more land for the purpose of erecting a large building. They employ 133 hands and report trade good.

J. T. Martin, Cleveland, successor to L. P. Gage & Co., wholesale and retail dealer in lumber and hard wood lumber, is doing a fine business at Stone's Levee, near Central Way.

The Aultman Agricultural Works, Canton, employ 740 workmen and manufacture daily thirty mowers and reapers, ten harvesters, six threshers, two Monitor engines and six twine binders.

The Diebold Safe and Lock Company, Canton, have just finished two large jewelry safes for a Boston firm Two steel jails have just been shipped from these works: one to El Paso, Texas; the other to Silver City, New Mexico.

The Ohio Coal Mining Augur Company, Canal Dover, manufacturers of coal mining augurs, and who have organized with a capital stock of $50,000, of which one fourth has been paid up, have commenced the manufacture.

The Miller Company, Canton, manufacturers of the Torrent Steam Pump, are running double turn with forty men, making eight pumps per day,many of which go to supply the demand of agricultural engine builders throughout the country.

Geo. S.Harker&Co., manufacturers of iron stone china and decorated ware, East Liverpool, are turning out some fine artistic styles of table china. They employ 90 hands. Their works are very extensive, and the full capacity of these is being taxed.

W. F. Whitmore, dealer in hardware and agricultural implements, Kent, has been in business two years, and reports trade as rapidly improving.

The planing mill of Mr. Geo. H. Dingledy, Yonngstown, is turning out a large amount of work. His yard has a large stock of rough and dressed lumber, and he is able to meet all requirements of builders in flooring, siding, doors, sash, &c.

The Blakeslee Manufacturing Company, Cuyahoga Falls, is a new concern organized to manufacture Blakeslee's improved forged nut machines, and heading machines for heading rivets, plow boats, track bolts, square and hexagon head bolts, &c.

The Robinson Wheel Company, whose shops were burned in Cincinnati some time ago, have made arrangements with the hub and spoke factory at Lawrenceburg, Ind., for the use of their machinery to furnish wheels to supply their customers until their works are rebuilt.

The Cleveland Diamond Fire Brick Company, Newburgh, the proprietors of which are Messrs. Wright & Knowles, have been in business six years. Their specialty is No. 1 brick. Their chief business is local, but they ship large quantities to Chicago and Eastern cities.

J. & J. M. Gledhill, Ravenna, are full of orders for the woolen goods they manufacture. They commenced operations fifteen years since, and have established a high reputation for their goods. Their skill and experience gives them special advantages as purchasers in the wool markets.

The creditors of the Atwater Stoneware Company, Atwater, have received notice that their suit in the District Court has been continued until its next session, which will be in the Spring of 1882, which implies that the pottery works must remain idle, and that the creditors must exercise great patience.

Mr. Geo. Mittinger, who carries on a manufactory for metal spinning in brass, copper, zinc, tin, &c., at 33 St. Clair street, Cleveland, commenced business in 1873. He is the only metal spinner in this city, and one of the most interesting mechanical sights is presented in the operations to be seen in his establishment. In the spinning process great dexterity and much ingenuity is required. Mr. Mittinger has had no less than 24 years experience in his art. He manufactures the "Star Cuspador" of which he is patentee. His trade is good; his manufactures are sold principally in Cleveland.

The Cope & Maxwell Co., Hamilton, write to the *American Machinist:* The demand for all regular stock sizes of mining pumps, fire pumps, and boiler feed pumps is unprecedented, requiring our works to run to its utmost capacity. The prospect for trade for the future is very flattering indeed, and the tendency of prices are upward in order to keep pace with the increased price of labor and material. Skilled labor is very much in demand. Business with us is remarkably good. We are continually adding to our already large works and plant tools and appliances to facilitate the filling of the already large number of orders on hand. We are now working, in addition to the day force, a night gang until 10 o'clock at night, and as soon as more workmen can be had we shall run all night.

The following Ohio Companies have been incorporated: The Fountain Filter Company, of Toledo, capital $50,000.——The Farmers' and Mechanics' Union Stove Company, capital $8,000 Clinton County.——The Cleveland Lock Company, Cleveland: J. H. Teller, L. Austin, and others, incorporators: capital stock, $30,000. For the purpose of making and selling machinists' tools, locks and other shelf hardware, and other articles in the line of machine work.——The Nelsonville Foundry and Machine Company, Nelsonville; Thomas E. Knauss, Charles A. Cable, and others, incorporators; capital stock, $30,000. To manufacture cars and machinery.——The Cleveland Specialty Foundry Company, Cleveland; H. L. Milton, W. W. Baldwin, James M. Bates, and others, incorporators; capital stock, $50,000; shares, $10 each. To manufacture metal castings, and do a general foundry business.——The Jefferson Sugar Manufacturing Company, of Jefferson; capital, $50,000.——The Charles Stewart Paper Company, Cincinnati; capital $125,000.——The George Fox Starch Company, Cincinnati; capital $100,000.

The Sectional Assay Furnace of Mr. W. E. Judson, of Cleveland, is, owing to its proved advantages, coming into more extended use with assayers throughout the country. It is so constructed as to allow just the due ratio of expansion and contraction at given temperatures; failure to realize which causes parts of other furnaces constantly to give way. It is divided into parts independent and distinct from each other, and united by intervening rings of ample dimensions, thus reducing liability to breakage and adding to facility and safety of transport. The interior of the furnace is subject to inspection at any moment through a glass slide in front. Fuel is dropped in without opening a door. It is manufactured to order of any desired capacity; weighing from fifteen pounds upwards. Coal, coke or charcoal may be used.

The Akron Iron Co.'s rolling mills are doing a very brisk business. During the past year the company has erected a shop 36x75 feet in dimensions, which new building is used exclusively for the manufacture of their Patent Hot Polished Shafting. The rapidly growing demand for this company's product which has no equal in the country, has made it necessary for the concern to provide more machinery. Therefore four new cutting off lathes have been placed in position; an additional engine of 80-horse power has been purchased and will soon be in operation and three new polishing machines have also been ordered. This will give the mill two engines aggregating 120-horse power and a plant of five polishing machines, all devoted to the manufacture of polished shafting. The company intends erecting two additional puddling furnaces. The hot polished shafting, of which the Akron Iron Company are the exclusive manufacturers, is meeting with such universal success that all the improvements made have been necessitated by the growing demand for this grade of iron.—*Akron Beacon.*

The Akron Cutlery Works are now under headway, at least 30 dozen of pocket knives having been finished and have given the best of satisfaction to Mr. W. H. Carter, the very genial proprietor of the works, and to the tradesmen who have examined the goods. Work will be pushed as rapidly as possible in the future. The first knife finished was of the jack order and is carried by Mr. Carter himself. It was made by Mr. F. W. Woods. Mr. J. Miller finished the second knife, which was made a birthday present to Dr. I. E. Carter, father of the proprietor. The force of men will be increased as rapidly as machinery can be placed and gotten in readiness. Some of the knives made are of very ingenious device, and are a great improvement over the old style of pocket knives. —*Ibid.*

The outlook for business at the Buckeye Mower and Reaper Works, Akron, is very encouraging. The demand for this concern's machines is steadily growing. The number of complete machines, mostly combined, will in the future be increased to 73 per day which is 18 more than has ever before been required of this establishment. A large proportion of the binders will be of the cord style, a new machine recently perfected by Mr. Lewis Miller. The wire binder has no equal in the country.—*Ibid.*

IN GENERAL.

Richardson's new cannery at Dover, Del., will be completed next month.

Listowe, Canada, has a glove factory, making 60 different styles of gloves and mitts

Munson Bros., Utica, N. Y., recently shipped a 30-inch portable mill to Odessa, Russia.

The Holyoke Envelope Company have started business with a daily capacity of 600,000 envelopes.

A building will soon be erected at Adams, Mass., for the manufacture of emery at the mine of F. O Sayles.

A company for the manufacture of carriages and machinery steel is being organized in Columbus, Pa.

Mr. Eddy, of Hull, will employ 500 workmen in his match factory at Ogdensburg, Canada, this summer.

It is estimated that the expiration of the McKay patent, which it is said will occur next August, will save the shoe manufacturers of Auburn, Me., $300,000 per year.—*Boston Com. Bulletin.*

The Lobdell Car Wheel Company, Wilmington Del., has recently purchased 210 acres for the extension of its works.

Mr. Boyd, of Providence, R. I., is in Georgia in behalf of several New England capitalists, and is prospecting for the best place in the State to erect a large cotton factory.

The Nova Scotia Sugar Refining Company and A. G. Jones' sugar refinery at the Northwest Arm, have begun operations. Sugar is shipped from Halifax to Montreal weekly.

Chas. Hunt is soon to erect a mill for the manufacture of sugar at Bridgeton, N. J. He will put in 30 acres of sugar-cane this spring, and several of his neighbors will plant as much more.

The demand upon the Montgomery (Ala.) Oil Works for cotton seed meal is unprecedented, and taxes all their resources of supply to the utmost limit, to fill the constantly increasing orders.

The Lincoln Manufacturing Company of Chester, Pa., is a new company, organized with a capital of $100.000, to build and equip a mill for the manufacture of hosiery yarn for the Philadelphia market.—*Boston Com. Bulletin.*

An establisment for the manufacture of fertilizer from marl has been started at Mount Holly, N. J. The building contains one run of stone and a fifty horse power engine. The marl is ground to a powder and then put in sacks ready for use.—*Boston Com. Bulletin.*

A Plating Company at Stockton-on-Tees, England, have recently and successfully plated with nickel three large cylinder covers for marine engines on account of Messrs. Maudslay Son & Field. The largest cover weighs one and three-quarter tons, and is six feet six inches in diameter, It was plated in a large nickel bath and polished by one of Fenwick's patent portable polishing machines, which polished every particle of the surface.

A monster mill is to be built in Minneapolis which will turn out 5½ barrels of flour per minute, 333 barrels per hour, 8,000 barrels per day, 2,400,000 barrels per year (300 days). It will require 10,000,000 bushels of wheat per year to supply it, and the value of its annual product will be at least $14,000,000. It will make one-third of the present wheat crop of Minnesota into flour, and require an army of men to carry on the work growing out of its operations.

Manufacturing Capacity of the United States.

At the present time, when so much attention is being drawn to the productive power of the United States as a manufacturing community, it is interesting to compare our capacity in various branches of industry with that of Great Britain. The following table shows the status of the cotton interest in both countries at the present time:

	America.	Gt. Britain.
No. of cotton spindles	10,921,147	44,205,690
No. of cotton looms	250,212	514,911
Employes in cotton mills	181,628	482,903

The apparent disproportion between the number of looms in each country, as compared with the number of spindles, is due to the fact that a considerable part of the product of British spindles does not reach the looms of its own country but is exported in the form of coarse yarns. The next table shows the number of operatives employed, and wool consumed per annum in the woolen goods industry of the United States, as compared with Great Britain, France, Germany, Russia, Austria, &c.:

	Operatives.	Consumption, lbs.
United States	120,000	250,000,000
Great Britain	280,000	280,000,000
France	170,000	380,000,000
Germany	120,000	165,000,000
Russia, Austria, &c	223,000	408,000,000

The comparative production of pig iron in the United States and Great Britain for the year 1880 was as follows:

	United States.	Great Britain.
	TONS.	TONS.
Pig Iron	3,781,921	7,721,833

If the next ten years of our history show as great an increase as the decade just closed, the quantities of iron and steel produced in the United States will not be much less than in Great Britain. The daily capacity of the blast furnaces of the United States is 19,248 tons in 1880, against 8,357 tons in 1870—an increase of 130.32 per cent. The increase in the production of pig iron in Great Britain has been but 10 per cent in ten years.—*Boston Com. Bulletin.*

MECHANICAL RECEIPTS AND ITEMS.

Solder.

The fusibility of soft solders is increased by adding bismuth to the composition. An alloy of lead 4 parts, tin 4 parts, and bismuth 1 part is easily melted; but this alloy may itself be soldered with an alloy of lead 2 parts, bismuth 2 parts, and tin 1 part. By adding mercury a still more fusible solder can be made. Equal parts of lead, bismuth, and mercury, with two parts of tin, will make a composition which melts at 122 Fahr.; or an alloy of tin 5 parts, lead 3 parts, and bismuth 3 parts, will melt in boiling water. In mixing these solders melt the least fusible metal first in an iron ladle, then add the others in accordance with their infusibility. To cast strips of solder, pour the molten metal on a flat surface of stone or metal, drawing the ladle along the while to leave a thread of metal of the desired substance.

To Harden Steel.

A very fine preparation for making steel very hard is composed of wheat flour, salt and water, using say two teaspoonfulls of water, one half teaspoonful of flour, and one of salt; heat the steel to be hardened enough to coat it with the paste—by immersing it in the composition—after which heat it to a cherry red and plunge it in cold, soft water. If properly done, the steel will come out with a beautiful white surface. It is said that Stubbs' files are hardened in this manner.

Useful Soldering Fluid.

Small pieces of zinc are immersed in muriatic acid and left in it until the acid is saturated with it, which may be known by the cessation of ebullition of the acid, and also by the zinc, after that stage, being left undissolved; add spirits of ammonia, about two-thirds of the quantity of the acid; thin with a little quantity of rain water. When, at the time of adding the zinc, if the muriatic acid is heated to a low degree, the solving of the zinc will be achieved sooner. This fluid does not cause rust on iron or steel, and is excellent for all purposes, even for tinning.

Jacketing Steam Pipes.

The following is a simple means of jacketing steam pipes: A few strips of hoop iron, to the lower side of which strips of wood are secured, are fastened in a position parallel to the longitudinal axes of the pipe by turning their two ends over at right angles, and firmly screwing these ends between two adjacent flanges. The framework thus obtained around the pipe is covered by a sheet of roofing paper, with the exception of three inches near the flanges, which are left free to permit easy access to the screws. The space thus left is filled with felt. Pipes so covered have endured fifteen years, exposure without repairs. The method is cheap, easily applied, reliable, and it possesses the advantage of being very light.

Iron and Steel.

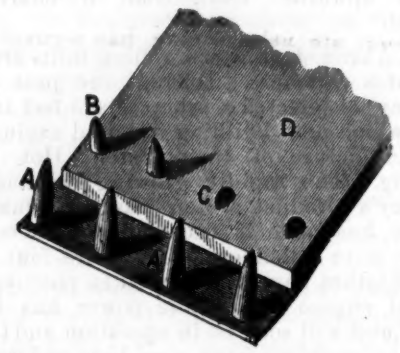
Good iron and good steel should be of close, uniform grain, bright grey color, more or less of silky fibre. The dull, earthy color, loose texture and unequal grain or blackish fibre are bad signs. Steel fractures are either granular, crystaline, or fibrous. Wrought iron, if broken suddenly, will show a crystalline fracture, while if broken gradually will appear fibrous. If it is good iron and suddenly broken, the grains will be fine, bright and uniform. Poor iron suddenly broken shows large, coarse, dull grains. Good iron, gradually broken, shows fine, close fibres, while poor iron, gradually broken, shows fibres that are coarse and open. If it should be desired to make the fracture of a piece of iron appear entirely crystalline instead of entirely fibrous, all that would be necessary would be to so alter the shape of the specimen as to render it more liable to snip suddenly, or to make it harder by any treatment, or to apply the strain suddenly, so as to make it snip quickly. In the one case the threads are gradually drawn out and are seen externally; in the other they are broken square across. Slowly applied strain gives a silky fibrous structure, while quick breaking gives a granular structure. The color of steel fractures is light pearl grey.

THE coal area of the world is thus divided: Europe aggregates about 3,500 square miles, Great Britain 5,400 while North America has has an area exceeding 300,000 square miles! That of England is less than the area of Massachusetts. It is estimated that at the present rate of consumption there is coal enough in England to last 1000 years.

THACHER'S PATENT BELT FASTENERS.

Thacher & Co., Cleveland

We always feel pleasure in calling attention to really valuable inventions. Amongst these must be undoubtedly ranked Thacher's Patent Belt Fasteners, whether with reference to their effectiveness or durability. The difficulty encountered in piecing both leather and rubber belts to prevent fraying and ragged edges, and to secure a good level surface, is the flexibility of the material. The perfection of belt making is in securing rigidity of hold without occasioning any injurious strain on the material. The Thacher belt fastener of which we here present an illustration, is composed



of the best malleable iron and consists of a back, with a series of tapering pins projecting from the inner face and set in rows. Pins and backing are in one piece. A, represents one half of the belt fastener projecting at the side of the leather D and ready for an insertion in an adjoining breadth; B, the projection of the pins inserted; C, the clinch. This attachment is applied at given distances as required. The insertion is effected without punching the leather or rubber which thus closes firmly round the apertures made by direct entrance. The pins being forced through, the projecting portions of these are hammered down, the metallic facing on the opposite side receiving the impact of the blows. When in position, the grip is complete and keeps the leather or rubber on the side always the same width; in other words, the edges keep full out so as to strike in. The variations occurring in resistance with changes of speed in the engine are exceedingly trying to a belt, and ordinarily it is the fastenings that first presents signs of weakening, the loosening process materially injuring the belt. Thacher's Belt Fastener allows of no relaxation in its hold; and thus contributes in a marked degree to keep what may be properly termed equilibrium of position in the belt, irrespective of the number of breadths. In the experience of scores of eminent firms in all branches of machinery, Thacher's Fastener has proved all that could be desired, the proof of which is that those who have once used it, resort to it again, never thinking of taking belts fastened in the several modes with which our mechanical readers are doubtless familiar, modes good in their way as an approximation to what is required, but falling far short of the indubitable merits which the invention in question offers. The names of the firms and companies to whom we have referred have been placed before us by Messrs. Thacher & Co., but it would be invidious to make a selection. Suffice it to remark that they are names which "carry weight," representing among other branches of industry some of the largest iron and rolling mills, foundries and forges, saw and planing mills, agricultural implement works, bolt and nut shops, paint, oil and barrel manufactories, and which are to be counted by hundreds throughout the country. In addition to this fastening taking that compact hold which enables it to resist any strain, keeping, as it does, the edges in place without roughing up or after tendency to severance, it has the decided merit of involving the expenditure of less time and labor in putting it on than any other fastener. The fasteners are constructed for single and double leather and rubber belts. We have omitted to mention that Thacher's Belt Fastener is used extensively in the oil regions, which fact must be regarded as a recommendation of the strongest character. The patentee is Mr. Thacher; the offices of the Company are at 334 Euclid Avenue, Cleveland, where all sizes of the fasteners turned out may be seen. Their moderateness of cost, looking to their utility, is very striking. There are numerous special advantages attending the use of this fastener which we have not space to dwell on. This ingenious contrivance may be said to do away with the serious defects attending on other fasteners, reducing to a minimum the wear and tear and cost of maintenance of belts.

Lubricating and Lubricants.

All the jointed parts, the valves, the slides, steps, journals and gearings of any kind of machinery driven by steam, water or other power, require lubricating to relieve the friction lest overheating takes place, injures the machinery, and causes loss of power used to produce the motion. Lubricating is the interposition, between the surfaces, of substances which prevent abrasion and carry away the heat generated by friction. To do this economically and at the same time most efficiently is the aim of every thinking mechanic, and it requires not only thorough understanding of the motion of machinery but knowledge also of the nature and quality of the means adapted for that purpose. These means are oils, fatty matter, and, strange to say, minerals and metallic compositions. The oils and fatty matter are of themselves lubricants; the mineral matter can only be applied as such in conjunction with the former, which fact in itself should be proof of their being improperly classed among the lubricants. The metallic compositions applied in some instances act as an interposing cushion, and help to convey the frictional heat to the absorbing lubricant as much as the stream of water, sometimes applied, serves to carry away the heat which a heavy lubricant, on a heavy journal, is able to absorb but unable to eradiate fast enough. There are liquid and solid lubricants. The first are the animal, vegetable and mineral oils; the latter principally tallow or lard, or compositions of both, with lime, sulphur, lead, asbestos, graphite, soapstone, etc. The former are principally used on lighter and fast running machinery, the latter on machinery with slower motion and of heavier weight. Good lubricants should possess the following characteristics: 1. Sufficient body to keep the surfaces effectually from abraiding each other. 2. Greatest power for absorbing and eradicating the frictional heat. 3. Least inclination to decompose by either atmospheric influence or temperature. In other words they should be clear and unctuous, free from acid, gum or grit, of low gravity, and should retain a uniform consistency at all temperatures. It is difficult to find lubricants that possess all these characteristics combined, and inferior ones are often preferred to better ones from want of knowledge about them among those who are in charge of their use; it is not unusual, for this reason, to see thick, heavy oils used where more limpid ones would be appropriate, and vice versa, or unsuccessful attempts made to force good lubricants to work through contrivances inadequate to the requirements, or from false economy attempting to make lubricants of poor quality perform effective work where better ones would barely suffice. A little attention to and more earnest investigation of this subject by proprietors as well as employes, would do much towards the use of good lubricants only, and thereby save machinery and capital.

THE South Cleveland Paint Co., Broadway, Newburgh, was organized in October. 1880, the officers being Joseph Turney, President; James Walker, Treasurer; and William H. Caine, Secretary and Superintendent. Their paint is manufactured from pure linseed oil, white lead and zinc, is of the best quality and ground to a consistency ready for immediate use. The manufacturing operations of the Company proceed on the principle that the durability of all paints is in the oil, not in the pigment of which it is composed, and that any pigment that destroys the oil is not good for a durable paint. Chemical paints are apt not only to lose color but to disintegrate or blister and peel off.

A TARIFF DEMONSTRATION.—The Youngstown representatives of the Amalgamated Iron and Steel Association have appointed a committee to determine the place of meeting for the next annual tariff demonstration. It is thought that Beaver or Aliquippa will get it; and it is hoped that General Garfield and several of the Cabinet ministers will attend.

OVER 80,000 buffalos have within six months been killed in Montana, mostly for their hides, which bring from $2.25 to $2.75. Men in the fur trade say the animal will soon be extinct.

MISCELLANEOUS RECEIPTS.

To Preserve Leather.—To preserve leather hose, belting, etc.- in good condition, use crude castor oil, warmed, if possible, and freely applied. It increases the pliability of the leather and the cling of the belts, and does not become rancid. Rats avoid it. In hose it should be pumped in from the interior under considerable pressure,thus thoroughly filling the pores.

To Purify Expended Lubricating Oil.—It is found that the purification of expended lubricating oil is not only practicable as a scientific process, but may be made a matter of economical advantage as well. One of the means resorted to for accomplishing this is to procure a tube of about 16 gallons capacity, supplied with one spigot at the bottom and one about four inches above; into this are placed 6½ quarts of boiling water, and there are then introduced 2,000 grains of chromate of potash, 1,540 of soda, 1,920 of chloride of calcium, and 3,840 of common salt. To this are added 50 quarts of oil to be purified; stir thoroughly for five or ten minutes, and after standing perfectly quiet for a week in a warm place, the clear oil is drawn off by the upper spigot. This plan is found to produce on the whole the most satisfactory result by the most simple means.

To Bleach Straw.—To bleach straw plunge the straw tissue into boiling water, and let it remain in about ten hours. After that treat the straw during three hours with a solution of common black soap, with such force that when taken between the fingers it gives a greasy feel to the fingers. The temperature of this bath is maintained at 74° C.

How to Test Drain Pipes.—Take soiled cotton waste and sulphur, ignite it, and blow the smoke into the drain or pipes. If leakage exists in the latter inside of the house, the smoke and smell issue forth and show that something is wrong, and generally tell also just where the fault or faults are. Sulphur, as well known, is one of the best of disinfectants, and a dose of the fumes from this to the drains, after disease has been in a house, will effect much good.

Covering for Boilers and Steam Pipes.—The following is a French idea: The surfaces are covered with sawdust mixed with flour paste. If the paste is not very liquid, the mixture being used in the form of moderately stiff dough, and the surface of the boilers or pipes have been well cleaned from grease, the adhesion is perfect, and the material is free from cracks. Five layers of this composition are recommended, each about one-fifth of an inch thick. It is said that one inch of this composition will give better results than double that amount of the materials usually employed. The paste is composed of rough flour, without the addition of starch. The mixture can be applied without a trowel, and if there is much exposure two or three coatings of tar will render the composition impervious to water. Copper tubes should first be treated to a hot liquid solution of clay, so as to increase the adhesion of the sawdust.

Silver Dollars.—It is hinted at Washington that Mr. Windom will soon make an effort to get the standard silver dollars into circulation, and that to this end he will order the retirement of United States notes of smaller denomination than $5. If this works no special inconvenience the $5s and $10s may be retired. This policy will bring into active use the small gold coins, and Mr. Windom probably hopes that it will create such a demand for the silver dollars as gradually to draw them into circulation. The movement may be aided by the action of the International Monetary Conference if the majority of European countries agree to the ratio fixed by that conference, for in this way the market value of silver bullion will be made more stable than it otherwise would be.—*Boston Commercial Bulletin.*

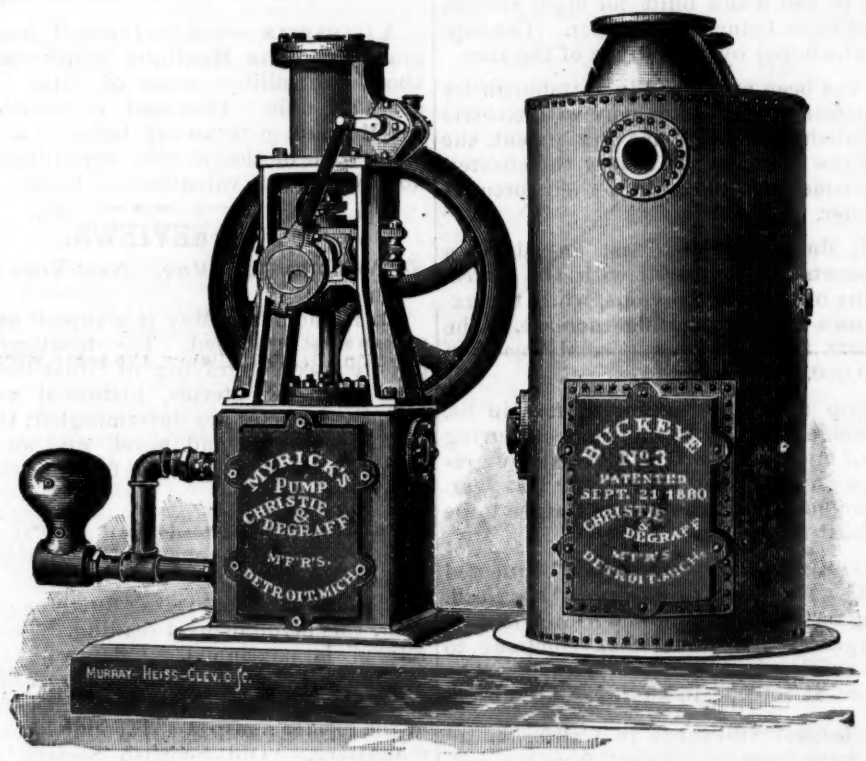
American Versus French Silks.—Worth, the great French dress maker, has given his fiat, from which the fashionable world has no appeal, in favor of American silks. Miss Kate Field recently took some choice specimens of these goods to Paris, and submitted them to Worth's critical examination; and so great was his admiration, that he even said that he didn't question that in a few years Americans will succeed in excelling the French as makers of the material, for the French silks are constantly deteriorating.

ENGINEERS' SUPPLIES.

The Buckeye Feed-Water, Heater and Myrick Pump.

Mr. George W. Turner has opened a large establishment at 171 River street, corner of St. Clair, Cleveland, stocked with all kinds of steam engineers' supplies. With the business of dealing in these he combines steam and gas fitting and copper smithing. Mr. Turner is one of our old lake vessel men, most favorably known to all our leading shippers in lake ports and captains sailing on our inland waters. He has had a wide experience as to the line of goods he is handling, and the owners of steam craft should give him a call, whilst all using steam will find their advantage in drawing on his stock and having recourse to his services. He has overlooked none of the engineers' supplies that are needed, and has secured first class workmen. Tantalizing and expensive delays only too frequently occur in getting ships properly equipped. Mr. Turner not only assures first class work, but guarantees that it shall be promptly done. All sorts of malleable and cast iron fittings, brass goods, and the best descriptions of valves, cocks, gauges, injectors, packing tools, lamps, ropes, &c., are to be found at his store.

We would call special attention to the Buckeye Feed-Water, Heater and Filterer and Myrick Pump, manufactured by Christie & DeGraff Frontier Iron Works, Detroit, of which Mr. Turner is proprietor. The following is an illustration of this valuable invention.



We proceed to enumerate the advantages obtainable by its use: First—The heater is simple in construction and all parts are easy of access for examination and repairs. Second—The feed water being introduced into the heater in such a manner that it meets the steam while still in a compact form in the exhaust pipe just before entering the heater, a higher temperature is thus attained than when the mixing of the steam and water takes place *after* the steam has entered the body of the heater and becomes expanded, thereby losing a part of its heat.

The steam in descending the heater strikes a spray of water, and the steam and water thus blended drop to the bottom of the heater and are then taken into the pump by syphon, whence they are forced into the boiler, the whole operation requiring but two seconds. The exhaust steam, usually allowed to pass off, or only partially giving off its heat to the water by circling round the boiler, is thus utilized to the utmost. So quick is the operation that the great body of the steam condenses itself at the moment when it goes into the boiler. No difficulty is experienced in obtaining a temperature of 212° at all times and under favorable circumstances 214° to 216° can be reached. Third—The heaters are provided with a perforated plate placed some distance above the bottom and upon this a thick layer of broken sand stone is put. The water after being heated to a high degree falls upon the sandstone and filters through it, reaching the heater clear of foreign matter, and as hot as it is possible to heat water with exhaust steam. Fourth—The construction of the pump is such that while the body and the main passages are inside of a shell or casing and surrounded by hot water the valve chests are outside and so arranged that the chests can be opened and the valves examined or removed for repair without drawing the water out of either heater or pump casing. This is an advantage offered by no other surface heater or pump and is so great that it will recommend itself to a practical engineer at once. Fifth—The workmanship upon Mr. Turner's heaters and pumps is of the very best description, and all the principal working parts are either of cast steel or brass, whilst particular care is taken to have all parts proportioned with a view to great durability and the least cost for repairs. Sixth—The Buckeye Heater does not allow oil or grease to pass into the boiler, as the water passes from the bottom of the heater to the pump casing, and is again taken from the bottom of this casing or tank by the pump. As oil or grease always floats upon the top of water, it will be seen that the water entering the boiler will be wholly free from these substances. Lastly—In addition to the great advantages already enumerated, the Buckeye and Myrick have all the lesser ones claimed for other heaters and pumps, such as not freezing in winter, freedom from leakage, compactness, ease of access and management, convenience for supplying hot and pure water for other uses, increasing revolutions of engine by partially condensing the steam, this last being an important matter where water is scarce, as the condensed steam goes back to the boiler in the form of water.

Driving Nails by Machinery.

Nails are now driven by machinery in most box factories where sufficient system and repetition exist to make it profitable, one machine doing the work of 10 or 15 men. The general idea of these machines is as follows: The nails are fed by hand into bell-shaped holes in a revolving disk. These holes are arranged in radial lines, each line with as many holes as there are nails wanted along the side of a box. This disk revolves and delivers the nails into bent tubes, each nail to a separate tube, which delivers it to a kind of a pair of nippers arranged in a row with others. Upon receiving their nails, the nippers advance simultaneously, so as to bring each its nail under a hammer, the point of the nail protruding below the embrace of the nippers. Self-feeding nail machines are beginning to occupy the attention of inventors with some degree of success. What are technically known as nails range from 1½ to 6 nails to a pound. But the genus extends upward, under the special name of spikes, to 2 feet or more in length, a single one of which will weigh from 6 to 15 pounds, and downward, under the name of brads, to one-quarter of an inch in length, and to 10,000 to a pound.—*Iron Age.*

GENERAL NOTES.

A great amount of building is going on in Akron. It is believed 2000 houses will be added this year.

George H. Warmington, of Cleveland, has bought the Grove Coal Company's property at Massillon for $6,000.

The approaching completion of the Welland Canal and the increasing development of the Mississippi river route threaten the traffic of the Erie canal.

Iron was so scarce in England during the reign of Edward III, that the pots, spits and frying pans of the royal kitchen were classed among the king's jewels.

At the store of J. N. Masters, 34 Prospect street, Cleveland, will be found an ample assortment of painters' supplies. Gasoline and coal oil are a specialty.

Four of the largest steel wire ropes ever made in this country are being placed in the Brooklyn Bridge, N. Y. Each rope is 1,550 feet in length, three inches in diameter and their aggregate weight is 102,495 pounds.

Several persons in Carroll county, O., are searching for a buried treasure of gold and silver coin, which was left there by the French when pursued by the British. Acres have been dug over, but all attempts have proved failures.

A hollow tree in Southern California has been converted into a dwelling. Doors and windows have been put in and floors built for eight stories, the entrance to them being by a ladder. The topmost room is shadowed by the foliage of the tree.

A company has been organized in Pittsburgh for supplying Pittsburgh and Allegheny with electric light. The Brush Company has the patent, the Westinghouse the plant, and others the charter, and they have concluded to combine their fortunes under one banner.

Each month since November last has shown a decrease of imports as compared with the corresponding months of the year previous, while the exports have shown a corresponding increase. The excess of imports this year may possibly reach in value $250,000,000.

Machine shop and foundry apprentices in St. Louis, Mo., receive $2.50 to $3.50 per week during the first year of apprenticeship, advancing by gradations to from $5 to $6 per week in the last year. Apprentices are not taken who will not agree to be bound for at least four years.

John J. Grant, for several years past connected with the Pratt & Whitney Company, of Hartford, Conn., as designer and assistant superintendent, is engaged in organizing a joint stock company to engage in manufacturing machinists' tools. The capital is named at $50,000, in shares of $100 each.

Some of the largest vineyards in California are on lands that have been purchased from the railroad company, many of them producing from 2000 to 10,000 gallons of wine annually, and in one instance producing yearly over 40,000 gallons. More than 200 varieties of grape have been imported from France, Spain, Germany and Hungary, and propagated in California.

We are glad to note that evidences of a good trade are showing themselves in many directions. To recompense for smaller profits manufacturers and merchants will find ample reward in a more extended field of operations and in greatly increased sales, so that the gross total of transactions is likely to exceed that of any previous year, and with more profitable results.—*Amer. Pottery & Glass Trade Rep.*

Parties who require steam fitting done well and promptly should have recourse to John E. Chafer, 44 South Water street, Cleveland. Mr. Chafer is well known as possessing the qualifications of a good, practical mechanic in his line, who has made it a study, especially with reference to low pressure. He has a staff of men on whom he has full reliance for workmanlike capacity and who are dispatched to all parts of the country. He makes it a point to have all orders executed promptly. There are parties who send mere boys on such business, but Mr. Chafer considers his reputation concerned, and does not trust such to others than skilled mechanics.

RAILROADS AND TRAFFIC.

During the coming season the N.Y. P. & O. Railroad Company will build an iron bridge East of Akron at the Old Forge over the Valley Railroad, and the old O. & P. Canal.

Now that the Dayton and Southeastern Railroad Company has been consolidated with the Toledo, Delphos, & Burlington Railroad Company, its subscriptions are worth, at the price Toledo, Delphos & Burlington securities are selling, about 37 per cent premium, but the last sale was at 10 per cent premium.

A large corps of surveyors are at present engaged in Aurora, O., resurveying the old Clinton Air Line, which has recently been rechartered under the management of the Western Reserve Railway Company.

Connotton track layers have reached the Cuyahoga river, but some time will elapse before the bridge is completed.

Enthusiastic railroad meetings in the interest of the Cleveland, Delphos and St. Louis Narrow Gauge have been held at Findlay, O , and elsewhere in the county.

The citizens of Monroeville, O., are laboring zealously to secure the location of the New York, Chicago and St. Louis railroad through their town.

The Valley Railroad between Canton and Cleveland, O., will commence running an additional train from tomorrow, May 1. The new time schedule goes into effect the same day.

A Canadian order in Council has been passed granting to the Manitoba Southwestern Railway about two million acres of land, equal to 6,400 acres per mile This land is described by Professor Macoun, government botanist and explorer, as being some of the richest agricultural land in the northwest, with valuable coal fields.

REVIEWS.

St. Nicholas for May. New York: Scribner & Co.

St. Nicholas for May is a superb number, second to none yet produced. The frontispiece is an exquisite steel engraving of "Just Before the Summer." Poems, stories, historical narratives, descriptive articles are intermingled; the engravings are both graphic and novel, and we heartily commend it to young folks for amusement and instruction.

Blackwood's Magazine for April. Reprinted; New York: Leonard Scott Publishing Co., 41 Barclay Street.

Like all the preceding numbers of the present year, this is full of good reading. "The Private Secretary" is continued. "Shadwell's Life of Lord Clyde" briefly sketches the career of that gallant soldier. "Vallombrosa" is an interesting account of the former and present condition of the famed monastery. "Old Scottish Society" gives a lively description of town and country life in Scotland seventy-five or a hundred years ago. "Greece and her Claims" discusses the present situation in the East. There is an amusing article entitled "Freaks of the Telegraph," enumerating many provoking blunders caused by carelessness either in writing or transmission, which, however laughable to read, must have been truly annoying to the recipients. They remind us of the printer who, in an article describing the great lubricating properties of the oil derived from a certain species of whale, and closing the list with saying, that "sailors use it for oiling their hones," converted into "tailors use it to oil their bones." Other periodicals published by the company are: The London Quarterly, Edinburgh, Westminster, and British Qnarterly Reviews.

Golden Days for Boys and Girls. Philadelphia: James Elverson, S. W. Corner Eighth and Locust Streets.

This admirable weekly, which contains abundance of stories, sketches and information in amusing guise, such as must rivet the attention of youth, offers none of the sickly sentimental trash so abundantly served out in many other youths' weeklies. Our opinion is that it is the best weekly for children in the land. Only its enormous circulation would pay interest for the outlay in contributions from the best writers in its line, and its abundant and excellent illustrations.

SCIENCE AND INVENTION.

Uniform Time.—The question of a uniform standard of time in this country for both popular and scientific use having, says *Science*, been examined by the American Meteorological Society, Professor Barnard, its president, has recommended the adoption of five sectional standards for the American continent. The standard meridians he would use are those of 60°, 75°, 90°, 105° and 120° west of Greenwich. The time of the first would be known as "Eastern time," and would be the standard in Newfoundland, Nova Scotia and New Brunswick. The next would be "Atlantic time," current from Maine to Florida. Then would come "Valley time," for the centre of the continent; "Mountain time," for the Rocky Mountain region; and finally "Pacific time," for the Pacific States and British Columbia. Each of these standards would be exactly one hour later than the one east of it; and the first would be just four hours later than Greenwich time. The central meridian of 90°, which passes through the Mississippi Valley, and might be regarded as the standard time of the United States, would be just six hours later than Greenwich time.

Metallic Belt.—An inventor in Hartford, Conn., has patented a belt which is made of iron wire, the selvages being brass and copper. The weft is of cotton, several threads being woven in without being twisted together. A double fabric is made, between which, or inside of which, a number of single heavier wires are enclosed to take the tensile strain of the belt

Transmission of Motion.—A patent recently granted in Vienna and Berlin uses bands of steel, tempered and hardened, to transmit motion from one pulley to the other. the faces of the pulleys being turned perfectly flat and then faced with a varnish of resin, shellac and asphalt. The fastening of these belts is of a peculiar structure and can not properly be described without engravings.

A Color Organ.—A curious musical instrument called a color organ has been invented. When the various notes are sounded by touching the keys, different combinations of colors are reflected upon a ground glass plate, and these change and blend in a charming manner as a quick air is played. Thus two senses are gratified at once, and the beholder feels more than he understands the harmony between melody and color.

An Electrical Probe.—M. Trouve, the well-known Parisian instrument maker, has opened up a fertile field of invention by applying electricity to surgical requirements. His polyscope for lighting up inaccessible cavities of the body, by means of a small platinum spiral rendered incandescent by the electric current, has been generally adopted by scientific dentists; and his new electric probe is likely to be useful also. It consists of two metal stems placed side by side, but separated by an insulator, and terminated by two very sharp points. Conducting wires are connected to the butt ends of these two blades, and include in their circuit a small inverting battery and a tiny trembler bell. When the probe comes into contact with a metallic body in the wound, say a ball or spark of metal, the circuit is completed across its points and the bell is rung, thereby announcing contact to the operator. The conductivity of bone, wood, or flesh is too feeble to make the bell ring; but a fragment of metal serves at once to do so. Lead can be distinguished by the continuous ringing which it gives, owing to the penetration of the points into its mass; while iron or copper gives a jerky sound, and the approach of a light astatic magnet suspended by a wire without torsion will enable the surgeon to tell iron from copper. The same arrangement has been applied by M. Trouve to surgical forceps for extracting foreign bodies out of wounds, and the surgeon is informed by the trembler that he holds the body in their grasp. A recent notable case of extracting a steel spark from the eye of a Berlin workman by means of electro-magnetism deserves mention. The eye had become very much inflamed, and it was necessary either to extract the mote without delay or remove the eye itself. Dr. Hirschberg, a Berlin oculist, succeeded in the former plan by inserting a soft iron probe into the eye until it touched the mote, and then by magnetizing the probe with the help of an electro-magnetic coil he was able. to draw the dangerous intruder forth.

A company has been formed in Paris with a capital of 20,000,000 francs for the importation of American live stock.

MINES AND MINING.

Colorado is now the first in the list of the metal producing States, and produced in 1880 $21,283,989. California comes next with a production of $18,276,166, and Nevada next with an output of $15,031,621.

A device to detect whether a miner has opened his safety lamp or not has recently been invented in Berlin. It consists of a peculiarly marked strip of paper placed within the lamp in such a manner as to be partially destroyed by opening. The condition of this paper can be observed at any time through the glass cylinder.

The decomposition of limestone when attacked by carbonic acid gas and the action of water, is by no means the only cause of heat in mines which, in those of the lower levels, is often intense. Lime is local in its action, and the heat produced by it is confined to certain sections of the mines, while underlying the whole length of the lower level lodes, notably the Comstock, is that which causes the general heat; namely, the deposits of iron pyrites.

The coal and iron fields of Alabama are attracting a good deal of attention. The Warrior coal field is represented as a vast deposit of bituminous coal 5,000,000 miles in extent, embracing inexhaustible supplies of the finest varieties, including all grades of bituminous, semi-bituminous and cannel coal. The Black Warrior River is the coal basin, the dip being toward the river on both sides. This is the southern limit of the Appalachian coal formation.

The amount of gold and silver used for ornamentation, manufacture and the arts during 1880 is put at $12,600,000.

There are now 1,690 stamps in the Black Hills, sixteen mills, representing 465 stamps having been erected last year.

San Francisco advices state that business in the Comstocks is increasing. The majority have shown lately greater gains than at any time since the movement began. The cause of the advance is a profound secret. The fact that everything moves is evidence that developments have not been made at side stocks. Navajo has passed its dividend, and Eureka Consolidated has declared a dividend of 50 cents per share, and will have a surplus of $320,000 after paying the dividend.

According to Bartwell's new map, of Nevada county, there are 113 gold quartz claims, and 229 gravel. There are also several valuable copper and iron mines in the county. The total assessed value of mining properties exceeds $3,000,000. There are 44 quartz mills having 503 stamps.

The city of Durango, in Mexico, has a hill in its vicinity that is almost pure iron. It is two miles long, one mile wide, and 700 feet high. On its surface, uncovered and visible, are, according to estimate, two hundred millions of tons of iron ready to be placed in the smelting ovens that it is proposed to put up at the foot of the hill. A large part of the ore yields from 70 to 90 per cent. pure metal, and is easily worked and converted into steel. Wood for fuel in unlimited abundance is to be had near by, and good water is likewise accessible. Altogether, there seems to be no reason why Durango should not be a Pittsburgh or Birmingham in the near future, or even cast those cities of iron and flame entirely into the shade.

The steady improvement in depth in the copper lodes of this district, says the Houghton *Mining Gazette*, as is shown in the downward works of the Calumet and Hecla, Osceola, Quincy, Pewabic, Franklin, Allouez, Atnantic, and other industries, is now making itself felt in the purchase of the shares of these mines by people who are quietly putting them one side as an investment for income.

Quicksilver is the second in importance of mining products of California.

It is estimated that the gold product of New Mexico from 1849 to 1876 amounted to over $60,000,000.

The waste of material in coal mining is enormous. It is estimated that only two-thirds of the coal in workable veins is taken out; there is a further loss of 25 per cent. in the preparation and delivery. The Reading Railroad Company has spent $300,000 in the attempt to utilize waste coal by burning it in locomotives constructed for the purpose.

The recent earthquake shock in Colorado was most severe in the near vicinity of the Twin Lakes where it caused great consternation and alarm among the miners. Some men were engaged in blasting in a tunnel connected with the Steadfast lode, when the rumbling began. A dull roar like distant thunder was succeeded by a shock which dislodged a considerable mass of ore. When the vibration ceased, the men found that the entrance of the tunnel had been nearly closed by the falling rocks and that two miners named Adams and Sedgwick had been dangerously injured, the former, in all probability, fatally. Such is the story told by Philip Gunn, who has recently arrived at Leadville from the scene of this disaster.

The World's Fair Killed by Stupidity.—There seems to be hardly life enough left in the World's Fair project to enable it to give up the ghost decently. To all intents and purposes it is dead already. Its proper epitaph would be: killed by mismanagement. From the start it was the prey of jealousies, rivalries and intrigues, and was heavily loaded with hopeless incompetency. We say this without desiring to reflect upon a number of excellent, intelligent and patriotic citizens who at considerable sacrifice of time and money did their best to float the enterprise. They could not make headway against the ignorance and self-seeking stubbornness of the majority of their associates, and, unfortunately, they must share the blame for the failure of a project which started off with a great flourish of trumpets, and at one time awakened considerable interest among the people of the metropolis and the country at large. It was not their fault that the plan failed, but the public will not stop to discriminate between them and the egotistical blunderers upon the Commission. We believe the enterprise might have been made a great credit and benefit to the city and to the manufacturing and commercial interests of the nation, but it lacked a competent organizing brain from the beginning, and the busy, quick-witted New Yorkers, who are intolerant of stupidity, speedily perceived its defects, and making up their minds that it was doomed to failure, soon ceased to concern themselves about it. It would not be surprising if Chicago or St. Louis should pick up the scheme, and scraping off the barnacles fastened on it, should in a few years launch it with a characteristic Western hurrah.—*N. Y. Tribune.*

Use of Blowpipe.

For soldering small articles of jewelry the common blowpipe, such as may be bought at any tool shop for about sixpence, is used. The solder is sold at dealers in jewelers' requisites ready for use. Several sorts are used. Silver solder is for silver goods, in different qualities to suit different qualities of work. You have only to specify the purpose for which you intend to use it when buying and the correct quality will be given you. Gold solder, to be used for gold jewelry, is subject to the same condition. The quality of the solder is always a trifle less than the metal on which it is to be used. This is necessary, in order that the solder may melt before the article does. The flux used with both gold and silver solder is borax. Working jewelers generally rub a lump of borax on a piece of slate with a few drops of water, just as water colors are ground, to a cream like consistency. The solder is scraped clean to remove all trace of oxide, cut into little pieces, and mixed with the borax. The actual process of soldering will be modified to suit the peculiarities of the article which is to be treated. Usually the edges to be soldered are cleaned, wetted with borax fluid, and placed closely in contact. If possible the article is bound tightly together with binding wire. This is fine wire of soft iron, made specially for such purposes. A piece of pumice stone or charcoal is used to rest the work on whilst it is being heated. It is laid on this, with the joint uppermost; a few pieces of solder and a little borax are placed along the joint, and the article is ready for being heated. So long as there is sufficient for the purpose the less solder and borax used the better. Gas is generally used for heating with, but failing that a spirit lamp will answer for all small work. A small lamp suited for the purpose, to burn methylated spirit, can be bought for a shilling. With the blowpipe direct a jet of flame along the joint, at the same time heating the entire article till the solder runs, then the soldering is accomplished.—*Design & Work.*

Shaft Couplings.—There is an innate wildness in the average shaft coupling; an inborn tendency to get loose, split, ring off, stick fast, etc. It is not reasonable for any one to expect that a line of shafting will keep in good order if hung to the bottom of a springy floor. The shafting should not be put up before the floor has received some, if not all, of its load, especially if there be heavy machines above it, which will, when put up, tend to sag the floor. Where the shafting is attached to cast iron columns suporting the floor there is less trouble from sagging, either when the first load is put on the floor, or afterward when the building settles. The hanger adds nothing to the torsional resistance of the shaft which it supports. The torsional strength depends upon the length and diameter of the shaft. Some recommend that flywheels be put on long lines of shafting, as tending, in a great measure, to equalize the strain of transmission.—*Leffel's Mechan. News.*

Mr. Ellis, superintendent of the Welland Canal, telegraphs that the opening of the canal cannot take place before the 22d of May. News has just been received from Ottawa of a reduction in canal tolls, as requested by the Harbor Board.

The mica windows of coal-stoves can be easily cleaned with a soft cloth dipped in vinegar and water.

MARKETS.

Office of the Trade Review.
Friday Evening, April 29.

FINANCIAL.

In banking circles business has been active the past week. Rates of discount are 7 to 8 per cent; the rate for money on call is 7 per cent and on four and six months' time 6 per cent.

New York.--Advices from Washington leave no room to doubt that the plan of Secretary Windom will succeed. Indeed, it is now estimated that not more than $20,000,000 of the six per cent. will be presented for payment. In the stock market the temper of speculation has been tame. The downward movement of Lake Shore is attributed to the masked sales of Vanderbilt and to the prospect of a competing line being completed within the next eighteen months. Elevated Railway stocks represented by the Manhattan line are depressed, owing to the fact that unless the company is relieved from payment of overdue taxes it will become bankrupt. It is to be noted that the original subscribers to the $13,000,000 capital of the concern never paid in a dollar in cash. Houston and Texas Central, as an exception to the general market, have risen. Government bonds are strong and bids for the 4's have advanced to 115¼ bid and 115½ asked.

IRON.

There is the usual steady demand for pig iron, with restriction to immediate wants on the part of buyers for the commoner grades. For the finer grades, some of which are in limited supply, prices are somewhat stiffer, and in certain of these the supply is scarce. The quotations for Scotch pig are: Coltness, $24@$24.50; Langloan, $24@$24.50; Gartsherrie, $23.50@$24; Glengarnock, $22.50@$23; Eglinton, $21.50@$22. For manufactured iron, prices are somewhat easier. A satisfactory business is being done in sheet iron; mills are busy and orders waiting. In old iron the former improvement has not been maintained. Scrap is depressed; and baling hoops, turnings, old wheels and light iron have undergone a slight reduction. Business in cast iron is dull; rates are unchanged.

Cincinnati.-(Reported by Rogers, Brown &Co.) The pig iron market is quiet, but no sign of weakness is manifested. Charcoal foundry irons, being in short supply, are a trifle stiffer in prices. Coke foundry irons are also in steady demand at full prices. The trade in car wheel iron is active at ruling prices. In grey forge and stone-coal foundry grades there is little demand except for present wants. Prices, however, remain unchanged. Hot Blast Foundry Iron—Hanging Rock charcoal No. 1, $26.50@27.00, 4 months No. 2, 25@26, 4 mo.; Southern No. 1, $25@25.50, 4 mo.; No 2, $24.00@$25.00, 4 mo.; Strong Coke, No. 1, $24@24.50, 4 mo.; No. 2, 23.00@23.50, 4 mo.; No. 3, $22.50@23.00, 4 mo.; Hocking Valley, No. 1, $23.50@24, 4 mo.; No. 2, $21.50@$23, 4 mo.; American Scotch, No. 1, $22.50@23, 4 mo. Forge--Strong Neutral. No. 1 Mill, $22; 4 mo.; Cold Short, No. 1, $20.00@20.50, 4 mo. Car Wheel and Malleable--Hanging Rock Cold Blast, $40@43, 4 mo.; Hanging Rock Warm Blast, $30@35, 4 mo.; Southern Car Wheel $33@39, 4 mo.; Lake Superior, $33@39, 4 mo.; Lake Superior malleable, $33@$35.

Cincinnati.--(Reported by E. L. Harper & Co.)--During the past week we have had a good demand for standard neutral and red short irons.

TIN.

The market is fairly strong but quiet except for futures which are strongly held at better prices. There is a considerable demand for tin and terne plates and in the cheaper sorts a large business has been done.

COAL.

The striking miners of Corning, who have been on strike will probably resume next week at the reduced scale of seventy cents per ton. A great deal of interest has been felt in the matter for the reason that the Hocking Valley coal operators have given the miners notice that on and after May 1 the price per ton for mining will be seventy cents, and it is very likely that the miners will accept it without striking. Nearly every coal operator in the Mahoning Valley has all the orders he can possibly fill, and many have refused trade as they are unable to supply the demand for fuel. The prospects for steady work this season at all the coal banks never were brighter.

HARDWARE.

General jobbing business is brisk; prices on the whole are steady, and few price list or discount changes are to be noted. Cut nails are held steadily at the advance established by the Western Nail Manufacturers' Association, namely $3.15@$3.25, with such variation only as is influenced by the size of lots. Some large lots are moving. The manufacturers of bright wire goods at their meeting at New Haven, Conn., made a reduction to discount 70 and 10 per cent., formerly 60 and 10 per cent. Wrought brass butts, which a short time ago were firm at discount 50 per cent., are now offered at $75@76 and 5 per cent. These low rates are not likely to last long.

LUMBER.

The Cleveland lumber trade is fairly active, building requirements largely drawing on stocks. There is an urgent demand for prompt delivery. Prices are firm and the impression obtains that higher prices must rule before long.

WOOL.

Domestic wools continue firm. Sales of washed fleece have increased. Domestic wools hold their own in value. Owing to the backward season the new clips will be delayed. Less has been doing in foreign wool. We quote: XXX Ohio, 49@51; No. 1, 48@49; XX and above, 47@48; X, 46@47.

OILS.

We have to note no material change in petroleum products during the week. Lard oil is in demand at previous prices. Linseed oil is selling fairly, and we quote at 57c. for western and 62c. for Calcutta. Sperm has exhibited a slight activity during the week, and prices have advanced a little. Whale and lard oils remain as before. Cotton seed oils are quiet. The stocks of sperm are estimated at 20,225 lbs., and of whale 12,800 bbls. Fish oils are unchanged.

FLOUR.

Market firm. We quote: City makes XXX best White Wheat, $6.25; XXX White and Amber Wheat, $6.00; XX No. 1 Amber Wheat, $5.75. Country Brands.--White $6.00@$6.25; Amber, $5.50@5.75 for well-known brands; Minnesota Spring $6.25@6.50; Minnesota, patent process, $8.75@9.00. Rye Flour.--Steady at $5.00@$5.25. Hay.--Market steady and quiet.

LUMBER.

PLANK.

2 INCH--MIXED WIDTHS.

A 1&2, $45, A3, $35, B. $28, C. $18, D. $14, E. $12.

1¼ AND 1½ INCH.

A 1&2, $44, A3, $35, B. $28, C. 18. D $14. E $12.

BOARDS.

1 INCH MIXED WIDTHS.

A 1&2, $42, A3, $32, B. $24, C. $16. D. $14, E. $12.

STOCK BOARDS.

12 INCHES WIDE.

A3, $34, B. $26, C. $17, D. $14,

STRIPS.

6 INCHES.

A 1&2, $40, A3 $33, B. 28, C. $18, D. $14.

WORKED LUMBER

Flooring.

A3, $35, B. $30, C. $20.

Norway Flooring.

A3, $28; B $22; C $18.

Matched Drop Siding, 6 in.

A3, $36, B, $30, C, $20

Beaded Ceiling $2 higher than flooring

One half inch Bevel Siding.

A 1&2, $22, A3 $20, B $ 18

Ash Flooring, A1&2 $35.

BILL STUFF.

Small, 18 feet and under, $14.

18 feet and over, $4 less than length.

Long, small, $4 less than length.

SHINGLES, LATH AND MILL WORK

Shingles XXX 18 inches	$3.75
Shingles Clear Butts	2.75
Lath	2 50
Surfacing one side $1.00 2 sides	$1.75
Making, Flooring and Drop Sidings	2.50

HARDWOOD.

Oak, boards and plank, common	$15 00@$20 00
" boards and plank, clear	30 00@ 40 00
Blackwalnut, counter tops	125 00@175 00
" clear	80 00@ 87 00
" seconds	50 00@ 55 00
" culls	30 00@ 35 00
" firsts and seconds	65 00@ 70 00
" floor, 6-in. dres'd & mtchd	75 00@ 80 00
" floor, 3 and 4 in	80 00@ 88 00
Ash	28 00@ 45 00
Hickory	40 00@ 50 00
Maple	27 00@ 37 00
Butternuts, firsts and seconds	45 00@ 50 00
Cherry, firsts and seconds	52 00@ 63 00
Whitewood, clear	30 00@ 40 00
" common	20 00@ 25 00
" culls	13 00@ 14 00
Red Cedar Posts each	35@ 50

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To Gentlemen Wishing to Build.

I will make special arrangements on the W. S. Chamberlain Allotment, opposite the High School, on Willson Avenue.

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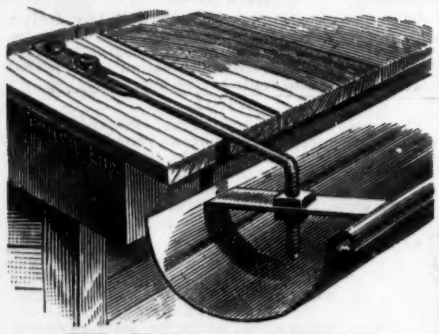

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Suspending Eave Trough Hanger

(Woodruff Patent,)

The best in the world! Made by

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N.B.—Also maker of Children's Carriage Spring Attachment Wagon Seats Springs, and Seats, Risers, Mill Picks, and Stone Cutters' Tools, etc. Pulleys for hoisting Eave Troughs, and tools for bending Hanger Rods.

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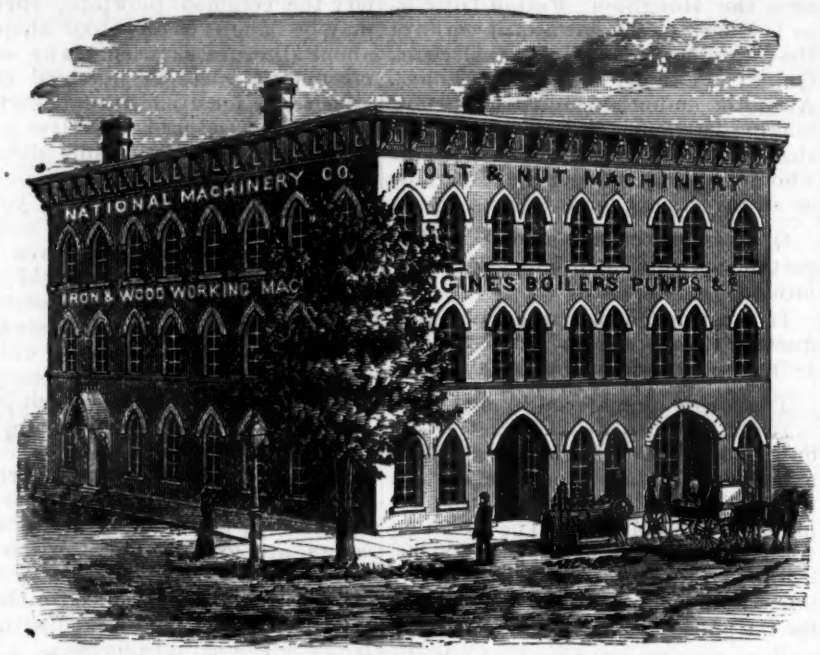

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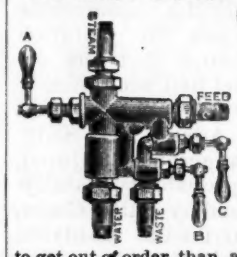

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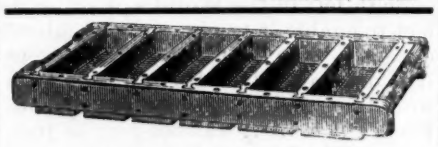

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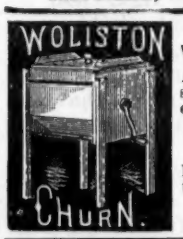

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